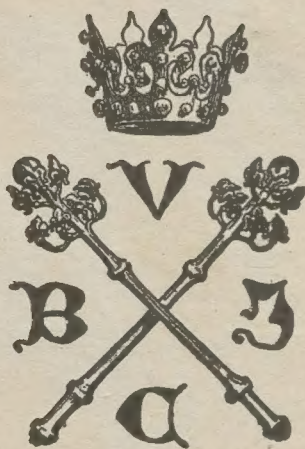




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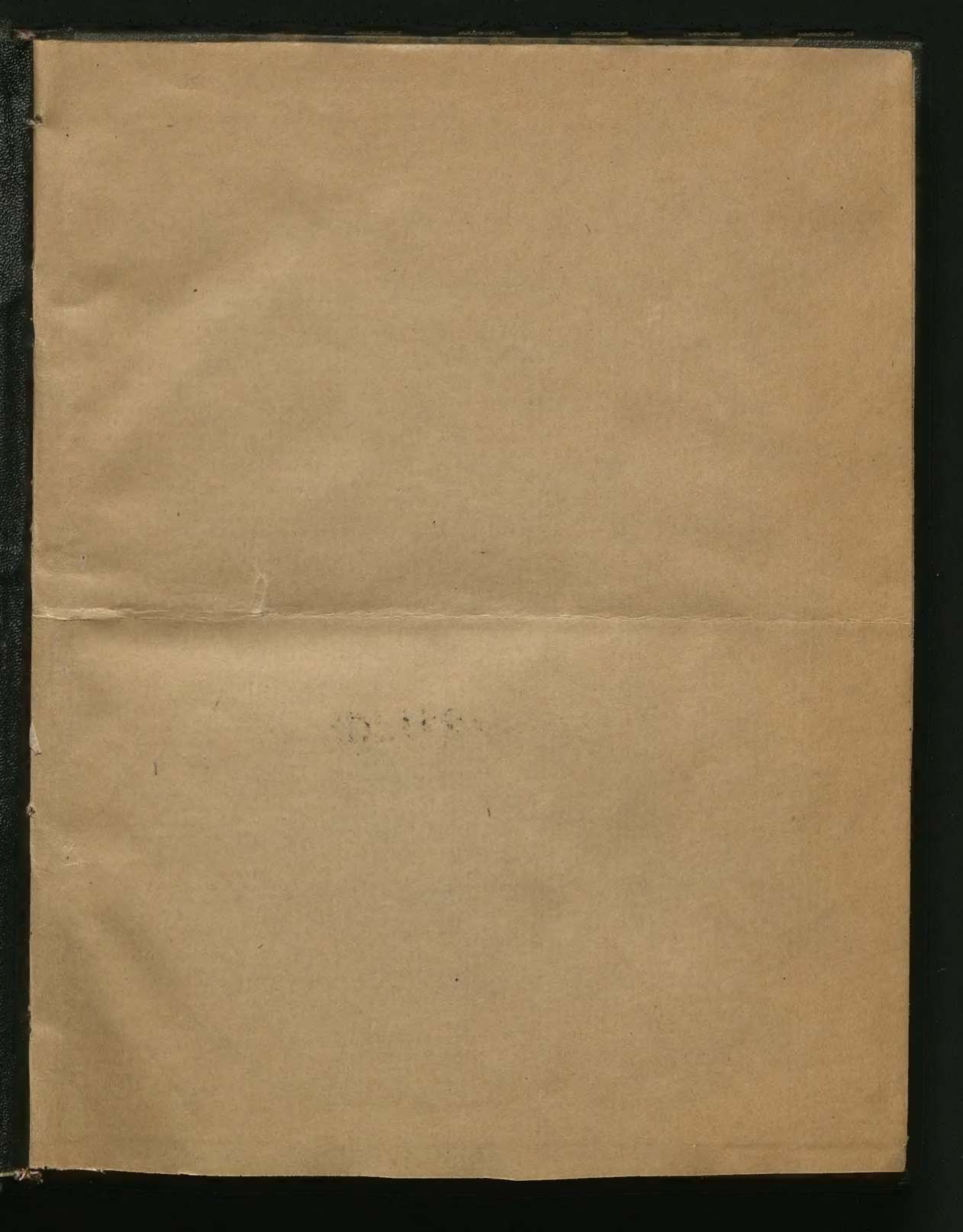
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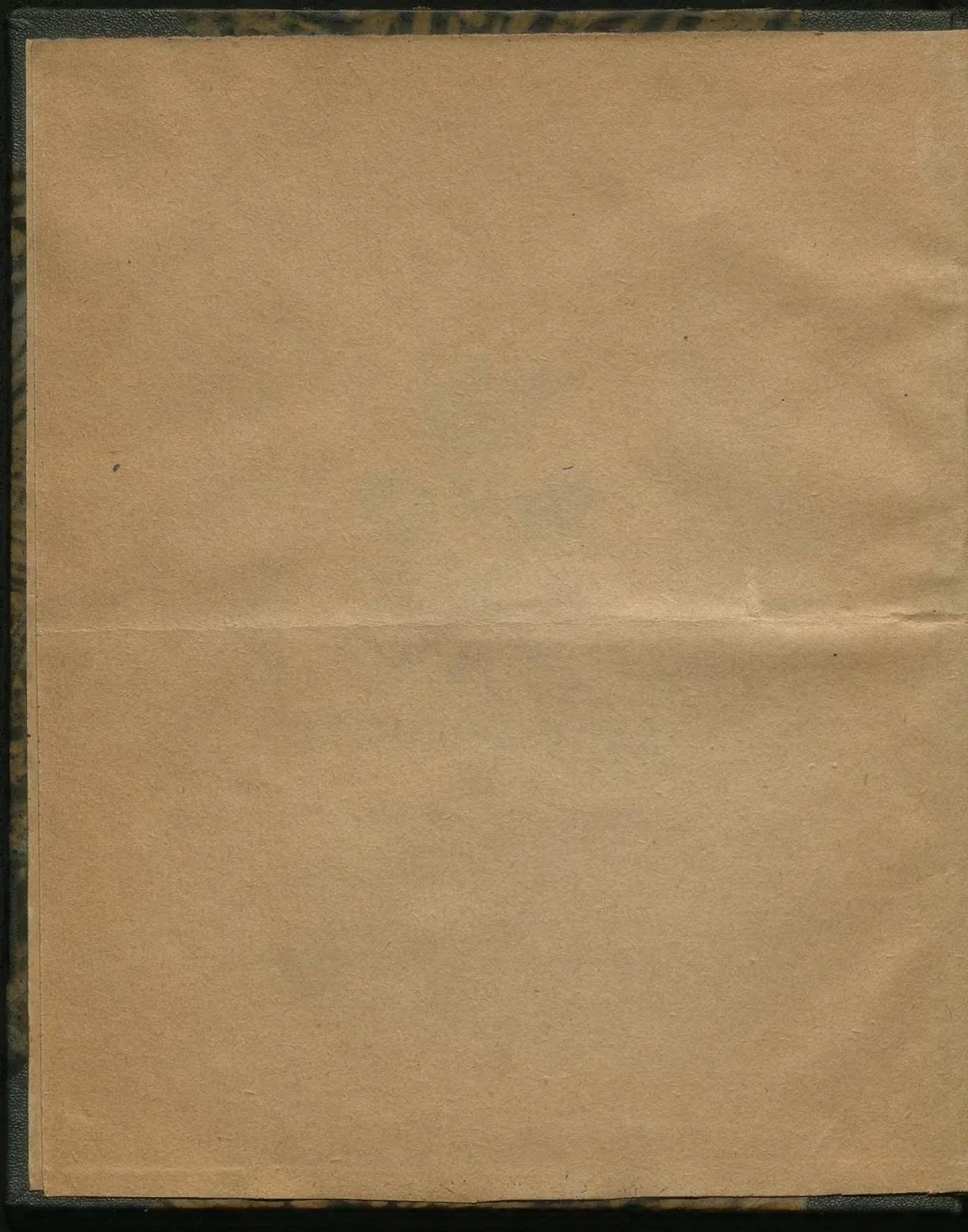
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Methodus infallibilis resolvendi summas excessus & defectus peripheriarum falsarum in excessus & defectus quæsitos, ut inde peripheria vera determinari possit.

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1. **P**eripheria excessiva est, quæ constat ex vera & excessu supra veram; defectiva autem est ea, quæ deficit aliqua parte à vera: ergo ablato excessu ex peripheria excessiva; vel addito valore defectus ad defectivam, prodit utroque modo peripheria vera:

2. Contrà ablata peripheria vera ex excessiva, relinquitur excessus, & dempta peripheria defectiva ex vera, remanet defectus: ergo ablata peripheria defectiva ex excessiva, relinquitur Summa excessus & defectus; ex quo palam est, cardinem rei hic verti in determinandis excessibus & defectibus legitimis: sit itaque.

3. **PROBLEMA I.** *Per rationes excessivas quascunque, non majores tamen quam $1:3\frac{1}{4}$. & defectivam communem $1:3$. determinare excessum & defectum peripheriarum falsarum diametri 8.*

RESOLUTIO. 1. Peripheria defectiva auferatur ex excessiva, ut innotescat summa excessus & defectus (§ 2.) 2. Ex numeratore hujus summa dematur denominator peripheriæ excessivæ, & prodibit excessus quæsitus. 3. Excessus inventus subtrahatur ex dicta summa, & habebitur defectus; sed majoribus numeris expressus, qui reductus per denominatorem peripheriæ excessivæ ad terminos minimos, manifestabit defectum quæsitum.

E. gr. Per rationem excessivam $100:324$. & defectivam $1:3$ emergunt diametri 8 peripheriæ falsa $2\frac{122}{100}$ & $2\frac{1}{4} = 2\frac{25}{100}$, quæ ex se demptæ, manifestant summam excessus & defectus $\frac{122}{100}$, ex cujus numeratore denominator 100 peripheriæ excessivæ ablati, prodit excessum quæsitum $\frac{122}{100}$, quo subtracto ex summa, innotescit defectus $\frac{7}{100}$ majoribus numeris expressus, quo reducto per denominatorem 100 peripheriæ excessivæ ad terminos minimos, innotescit defectus quæsitus $\frac{7}{100}$.

DEMONSTRATIO. Ablata peripheria defectiva $2\frac{1}{4} = 2\frac{25}{100}$ ex excessiva $2\frac{122}{100}$, prodit per §. 2. Summa excessus & defectus $\frac{122}{100}$, ex cujus numeratore denominator 100 peripheriæ excessivæ ablati relinquit $\frac{122}{100}$: ergo hæc summa est $= \frac{100}{100} + \frac{22}{100}$. Jam cum ad auferendam peripheriam defectivam $2\frac{1}{4}$ ex excessiva $2\frac{122}{100}$, necesse fuerit priorem reducere ad denominatorem posterioris, h. e. tam numeratorem 24, quam denominatorem ejus 1 multiplicare per 100; evidens est, etiam terminos defectus prioris centies fuisse multiplicatos in posteriore: consequenter hujus defectum non posse esse alium, nisi $\frac{7}{100}$, etsi summa in permultas alias partes resolvi queat. Ablato itaque hoc defectu ex summa $\frac{122}{100}$, necessario relinqui debet excessus quæsitus $\frac{122}{100}$, siquidem ea est conflata ex utroque. Et quoniam ex demonstratis patet, terminos defectus peripheriæ $2\frac{1}{4}$ centies minores esse debere, quam $\frac{122}{100}$, h. e.

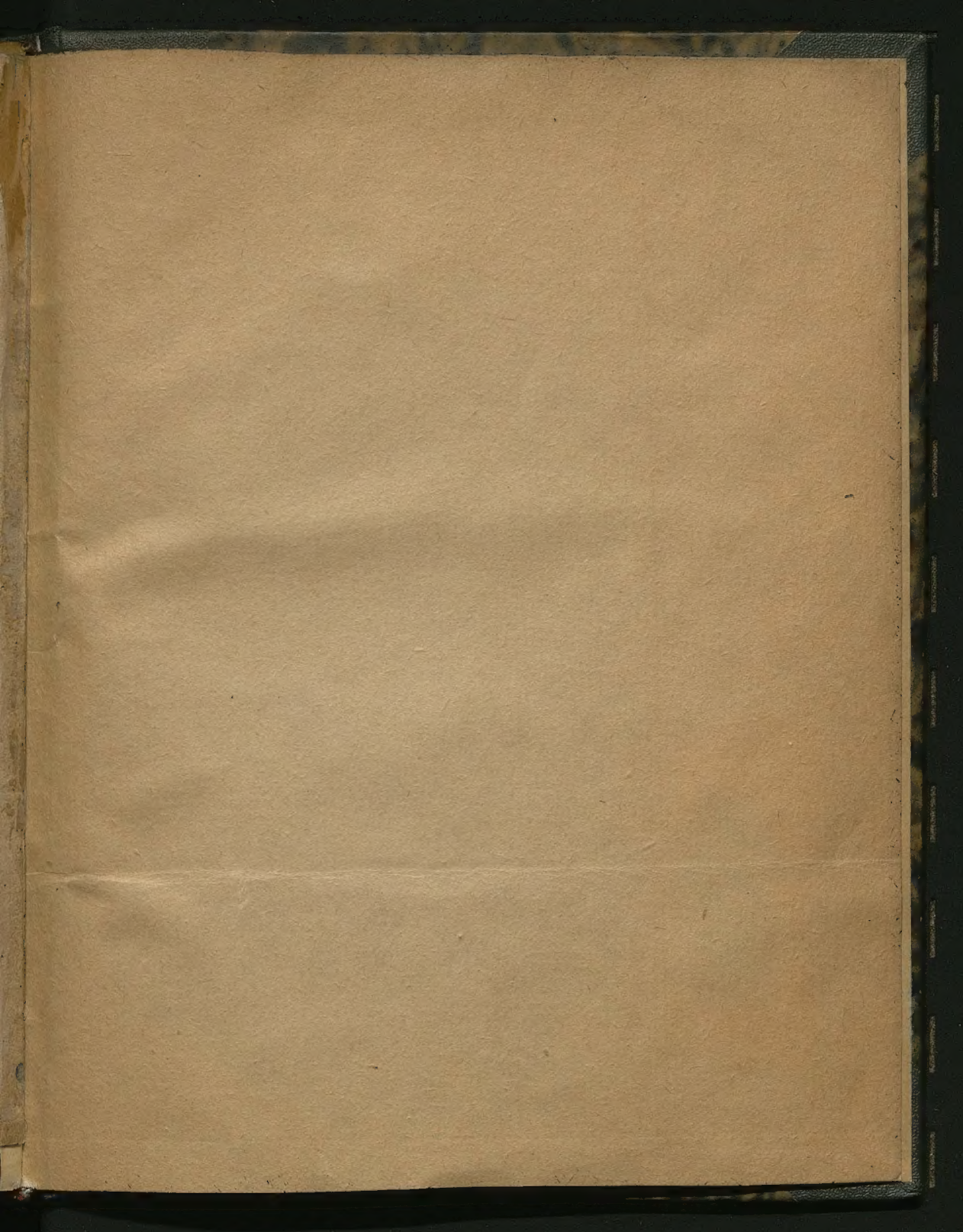
reducibiles per denominatorem 100 peripheria excessiva; nequit defectus quæsitus esse alius nisi $\frac{1}{2}$. Ergo peripheria vera diametri 8 est $2\frac{1}{2} + \frac{1}{2} = 2\frac{1}{2} = 25$, vel $2\frac{1}{2} - \frac{1}{2} = 2\frac{1}{2} = 25$, (§1) ad quam igitur diameter est, ut $8 : 25 = 1 : 3\frac{1}{8}$. Quoniam igitur, assumtis innumeris rationibus excessivis $4 : 13 ; 5 : 16 ; 6 : 19 ; 113 : 355 ; 71 : 223$ & defectiva communi $1 : 3$, peripheria diametri 8 per hocce problema semper prodit $= 25$; manifestum est, illud bene esse resolutum & demonstratum.

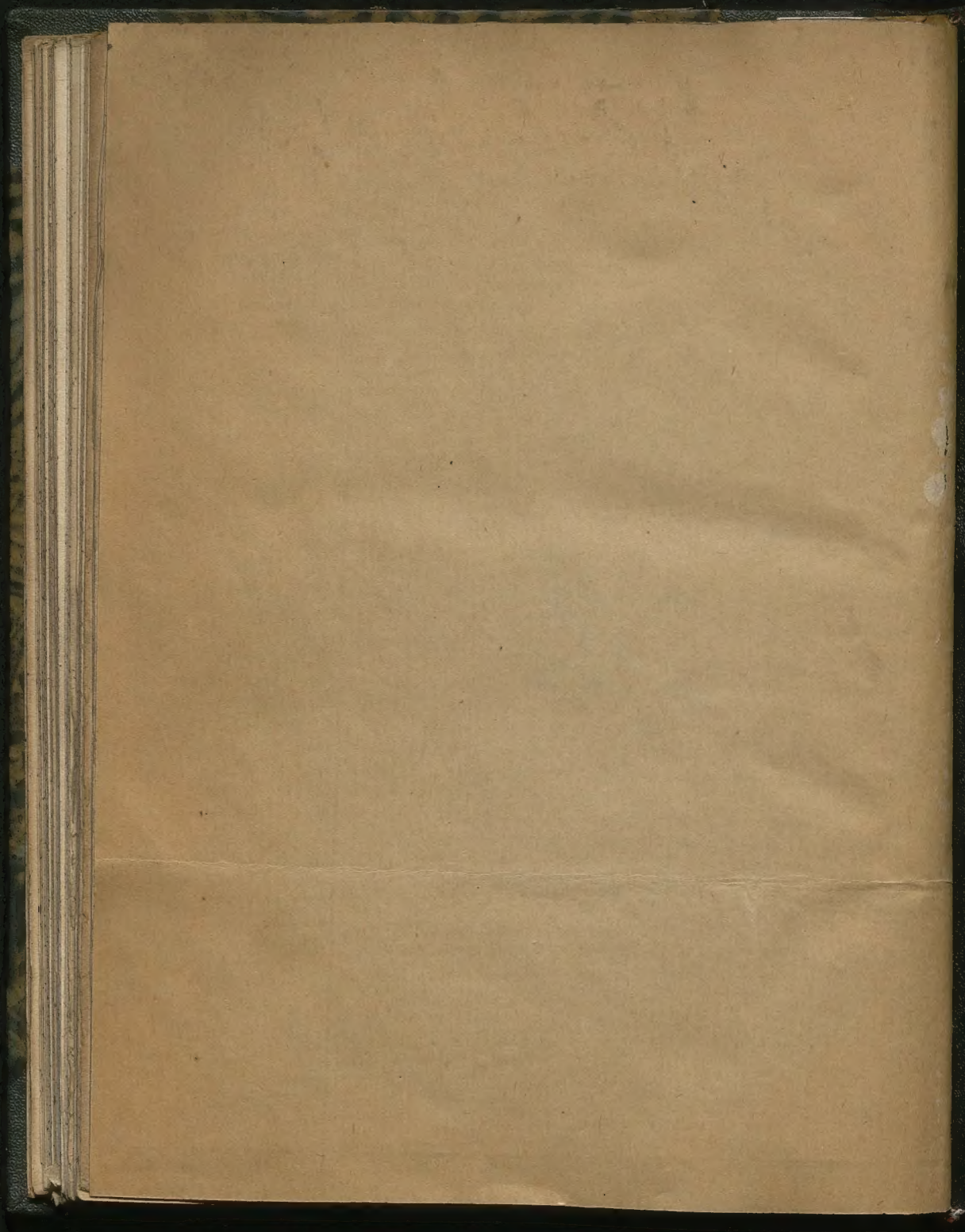
4. PROBLEMA II. *Per rationem excessivam quamcunque, non majorem tamen, quam $1 : 3\frac{1}{8}$ & defectivam paulo majorem, quam $1 : 3$, ut $9 : 28, 10 : 31, 11 : 34, 12 : 37$ &c. determinare excessum & defectum peripheriarum falsarum diametri 8.*

RESOLUTIO. Quoniam numerator summæ excessus & defectus constare potest vel ex denominatoribus simplicis; vel multiplex peripheriarum falsarum; vel ex denominatore simplo unius & multiplo alterius; subducatur denominator major ex numeratore summæ tamdiu, donec residuum sit exacte divisibile per denominatorem minorem; deinde tam simplo, vel multiplo denominatoris majoris invento, quam residuo divisibili per minorem, subscribatur denominator summæ; quo facto prodent 2 partes, quæ reductæ per denominatores peripheriarum falsarum, sistunt excessum & defectum quæsitum.

E. gr. Peripheria exces: diametri 8. per rationem $6 : 19$ inventa, est $1\frac{1}{2}$, & defectiva per rationem $10 : 31$ reperta, est $2\frac{1}{2}$, quæ reductæ ad denominatorem communem 60, sunt $15\frac{20}{60}$ & $14\frac{20}{60}$, quarum posterior ablata ex prior sistit summam excessus & defectus $\frac{20}{60}$, ex cujus numeratore 32 denominator major 10 bis ablatum, relinquit residuum 12 exacte divisibile per minorem 6. Ergo hæc summa est $= \frac{20}{60} + \frac{12}{60}$. Reducendo itaque $\frac{20}{60}$ per denominatorem 10 periph: defectivæ, prodit excessus $\frac{2}{3}$; reducendo autem $\frac{12}{60}$ per denominatorem 6 periph: exces: , innotescit defectus quæsitus $\frac{1}{2}$.

DEMONSTRATIO Quoniam ob reductionem peripheriarum falsarum per earum denominatores 10 & 6 ad denominatorem communem 60, termini excessus peripheria $1\frac{1}{2}$ decies, & termini defectus peripheria $2\frac{1}{2}$ sexies in summa $\frac{20}{60}$ existunt majores, ac erant antea, necesse est, illam resolvere in partes reducibiles per 10 & 6; sed ex omnibus partibus, in quas summa $\frac{20}{60}$ est resolvable, nullæ aliæ possunt reduci ad terminos minores per denominatores 10 & 6 peripheriarum falsarum, nisi $\frac{20}{60}$ & $\frac{12}{60}$: ergo etiam nullæ aliæ possunt esse partes legitimæ nisi $\frac{20}{60}$ & $\frac{12}{60}$, quarum prior reducta per denominatorem 10 defectivæ ad terminos minores, manifestat excessum verum $\frac{2}{3}$ & posterior reducta per denominatorem 6 excessivæ, defectum quæsitum $\frac{1}{2}$. Ergo peripheria vera est $1\frac{1}{2} - \frac{1}{2} = 1\frac{1}{2} = 25$; vel $2\frac{1}{2} + \frac{1}{2} = 2\frac{1}{2} = 25$. Jam cum per omnes excessus & defectus ope hujus problematis inventos, peripheria diametri 8. semper prodit $= 25$; evidens est, illud esse bene resolutum & demonstratum.





Biblioteka Jagiellońska



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